US Army Corps
of Engineers
Alaska District

Public Notice of Application for Permit

Regulatory Branch (1145b)
3437 Airport Way
Suite 206
Fairbanks, Alaska 99709-4777

PUBLIC NOTICE DATE: June 29, 2006

EXPIRATION DATE: July 31, 2006

REFERENCE NUMBER: POA-1992-574-T

WATERWAY NUMBER: Fish Creek

Interested parties are hereby notified that an application has been received for a Department of the Army permit for certain work in waters of the United States as described below and shown on the attached plan.

APPLICANT: Fairbanks Gold Mining, Inc. (FGMI), Post Office Box 73726, Fairbanks, Alaska 99707-3726

AGENT: Mr. Delbert Parr, Environmental Manager, FGMI, Post Office Box 73726, Fairbanks, Alaska 99707-3726, (907) 490-2207

LOCATION: 65.0000°N, -147.3271°W. FGMI's Fort Knox Millsite Lease (ADL 414960 and ADL 414961), approximately 26 miles northeast of Fairbanks, Alaska, located in sections 4, 8-17, 20-23, and 26-27, T. 2 N., R. 2 E., and sections 7-8 and 17-19, T. 2 N., R. 3 E., Fairbanks Meridian. The project area encompasses 7,605 acres.

WORK: The applicant proposes to update and renew the Fort Knox Reclamation and Closure Plan per the terms of FGMI's Corps permit 4-920574, Fish Creek 23. Additionally, the applicant proposes changing condition 9.a. of the above cited permit. Work would be performed according to the attached plans (sheets 1-33, dated June 23, 2006).

PURPOSE: The reclamation and closure of a commercial precious metals (gold) extraction site.

ADDITIONAL INFORMATION: The applicant has put forward a complete reclamation and closure plan for the Fort Knox Millsite Lease, including the mine pit, the mill and attendant structures, the tailing facility, and the proposed heap leach facility. FGMI has issued five documents detailing the reclamation and closure of the Fort Knox mine as well as the construction, operation, reclamation, and closure of the proposed heap leach facility. The documents are:

Walter Creek Valley Heap Leach Facility Project Description
Walter Creek Valley Heap Leach Facility Closure Plan
Fort Knox Mine Tailing Facility Closure Plan
Fort Knox Mine Reclamation and Closure Plan
Fort Knox Mine Monitoring Plan

These documents are available via the internet at the following website: www.dnr.state.ak.us/mlw/mining/largemine/fortknox/. Additionally, hard copies of these documents are available for review at the U.S. Army Corps of Engineers Fairbanks Field Office located at 3437 Airport Way, Suite 206, Fairbanks, Alaska, (907) 474-2166.

You are advised that this Public Notice is being issued jointly with the Alaska Department of Natural Resources Office of Project Management and Permitting Large Mine Project Team. Please note that the State is accepting comments on the design, construction, and operation of the proposed heap leach facility as well as any and all aspects of the reclamation and closure plan through July 31, 2006. The application for a Department of Army (DA) permit to discharge fill into waters of the United States for the construction of the heap leach facility is open for public comment through July 3, 2006, under Corps file number POA-1992-574-S, Fish Creek.

The narrative and figures attached to the current public notice are excerpted from FGMI's "Fort Knox Mine Reclamation and Closure Plan." Sheets 1-3 outline the need for the reclamation and closure plan and provide an overview of the location of the mine and its facilities. Sheets 4-12 describe wetland areas within the Fort Knox project area, Corps requirements for vegetative reclamation and restoration, a status update on wetland restoration, and a plan for final reclamation. Sheets 13-32 describe specific reclamation and closure activities for each mine facility, including the tailing facility and the proposed heap leach facility. Sheet 33 outlines the reclamation and closure schedule. If a Corps permit is issued, it would adopt the entire reclamation and closure plan, not just these excerpted sheets, in accordance with previous permit conditions. A Corps permit would also modify condition 9.a. of the original DA permit for Fort Knox.

Condition 9.a. of DA permit 4-920574, Fish Creek 23, requires "a mixture of aquatic sites (ponds, streams, and wetlands) and uplands" be constructed on the tailings bench in specific proportions and acreages: "wetlands (35%) = 424.5 acres; ponds (35%) = 424.5 acres; uplands (30%) = 364.0 acres; total acreage = 1,213.0 acres."

FGMI is proposing to remove the specific acreage requirements identified under condition 9.a. and instead adopt the general size and distribution of the reclaimed acreages per the attached sheets 4-8 and 18-22. Any modification to condition 9.a. would still require a mixture of vegetation and aquatic types, including various wetland types (i.e., emergent, scrub-shrub, and forested wetlands). Further, the Corps would require reclaimed pond, wetland, and upland acreage to be broadly distributed across the millsite lease, including around the tailing facility impoundment (sheet 23), along Fish Creek (sheet 25), and around the freshwater reservoir (sheet 31). Additionally, FGMI is proposing to adopt a functional value approach to the restoration work, specifically to restore 110% of the pre-Fort Knox development function of wetlands and aquatic features within the millsite lease. An explanation of the most recent wetland functions and values analysis for the Fort Knox project is presented on sheets 9-11.

Sheets 18-33 discuss facility-specific reclamation and closure activities. The table below outlines the Corps' permit history for the Fort Knox project:

Permit Number	Date Issued	Authorized Work
4-920574	May 5, 1994	4,526,140 cy fill into 377 acres wetlands
M-920574	July 3, 1995	10,000 cy fill into 4.8 acres wetlands
N-920574	April 12, 1999	R&C plan due by April 30, 2003*
POA-1992-574-O	April 7, 2004	time extension for R&C plan
POA-1992-574-P	April 15, 2005	time extension for R&C plan
POA-1992-574-Q	March 9, 2006	final time extension for R&C plan
POA-1992-574-R	May 16, 2006	3,100 cy fill into 0.33 acres wetlands

* R&C = Reclamation and Closure

WATER QUALITY CERTIFICATION: A permit for the described work will not be issued until a certification or waiver of certification as required under Section 401 of the Clean Water Act (Public Law 95-217), has been received from the Alaska Department of Environmental Conservation.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, reasons for holding a public hearing.

CULTURAL RESOURCES: A comprehensive cultural resource program for the entire Fort Knox Millsite Lease was conducted in four phases between 1990 and 1993. Field inventories and evaluations were conducted in 1992, and additional site specific investigations were conducted in 1993. According to FGMI's "Fort Knox Mine Environmental Assessment" (August 1993), 98 cultural and historic resources were identified within the lease area, including numerous paleontological remains, seven prehistoric sites, and many sites related to early mining activities within the project area (page 3-126). SHPO determined 26 sites were eligible for inclusion in the National Register of Historic Places and that 11 of these eligible sites required additional evaluations by the project Memorandum of Agreement (MOA) among the Corps, SHPO, FGMI, the Advisory Council on Historic Properties (ACHP), and the Fairbanks Historical Commission. The MOA was signed in October 1993, and the "Fort Knox Project Cultural Resources Program Mitigation Report" was completed in August 1994. The current application is being coordinated with SHPO. Any comments SHPO may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit will be considered in our final assessment of the described work.

ENDANGERED SPECIES: No threatened or endangered species are known to use the project area. Preliminarily, the described activity will not affect threatened or endangered species, or their critical habitat designated as endangered or threatened, under the Endangered Species Act of 1973 (87 Stat. 844). This application is being coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Any comments they may have concerning endangered or threatened wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

ESSENTIAL FISH HABITAT: The proposed work is being evaluated for possible effects to Essential Fish Habitat (EFH) pursuant to the Magnuson Stevens Fishery Conservation and Management Act of 1996 (MSFCMA), 16 U.S.C. et seq and associated federal regulations found at 50 CFR 600 Subpart K. The Alaska District includes areas of EFH as Fishery Management Plans. We have reviewed the January 20, 1999, North Pacific Fishery Management Council's Environmental Assessment to locate EFH area as identified by the National Marine Fisheries Service (NMFS). We have determined that the described activity within the proposed area will not adversely affect EFH, including anadromous fish and federally managed fishery resources.

SPECIAL AREA DESIGNATION: None.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity and its intended use on the public interest. Evaluation of the probable impacts, which the proposed activity may have on the public interest, requires a careful weighing of all the factors that become relevant in each particular case. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. The decision whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur, are therefore determined by the outcome of the general balancing process. That decision should reflect the national concern for both protection and utilization of important resources. All factors, which may be relevant to the proposal, must be considered including the cumulative effects thereof. Among

those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(1) guidelines. Subject to the preceding sentence and any other applicable guidelines or criteria (see Sections 320.2 and 320.3), a permit will be granted unless the District Engineer determines that it would be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Comments on the described work, with the reference number, should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. Please contact Sharon Seim by email at Sharon.G.Seim@poa02.usace.army.mil, by phone at (907) 474-2166, or by FAX at (907) 474-2164 if further information is desired concerning this notice.

AUTHORITY: This permit will be issued or denied under the following authority:

(X) Discharge dredged or fill material into waters of the United States - Section 404 Clean Water Act (33 U.S.C. 1344). Therefore, our public interest review will consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 CFR 230).

A plan and Notice of Application for State Water Quality Certification are attached to this Public Notice.

District Engineer
U.S. Army, Corps of Engineers

Attachments

FRANK H. MURKOWSKI, GOVERNOR

STATE OF ALASKA

OFFICE OF THE GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF WATER
Non-Point Source Water Pollution Control Program
401 Certification Program

NOTICE OF APPLICATION
FOR
STATE WATER QUALITY CERTIFICATION

Any applicant for a federal license or permit to conduct an activity that might result in a discharge into navigable waters, in accordance with Section 401 of the Clean Water Act of 1977 (PL95-217), also must apply for and obtain certification from the Alaska Department of Environmental Conservation that the discharge will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. By agreement between the U.S. Army Corps of Engineers and the Department of Environmental Conservation, application for a Department of the Army permit to discharge dredged or fill material into navigable waters under Section 404 of the Clean Water Act also may serve as application for State Water Quality Certification.

Notice is hereby given that the application for a Department of the Army Permit described in the Corps of Engineers' Public Notice No. **POA 1992 574 T, Fish Creek 23** serves as application for a short-term variance of State Water Quality Certification from the Department of Environmental Conservation, as provided in Section 401 of the Clean Water Act of 1977 (PL 95-217).

The Department will review the proposed activity to ensure that, except for an allowed, short-term variance, any discharge to waters of the United States resulting from the referenced project will comply with the Clean Water Act of 1977 (PL95-217), the Alaska Water Quality Standards, and other applicable State laws. The Department also may deny or waive certification.

Any person desiring to comment on the project with respect to Water Quality Certification may submit written comments within 30 days of the date of the Corps of Engineer's Public Notice to:

Department of Environmental Conservation
WQM/401 Certification
555 Cordova Street
Anchorage, Alaska 99501-2617
Telephone: (907) 269-7564
FAX: (907) 269-7508

1.0 INTRODUCTION

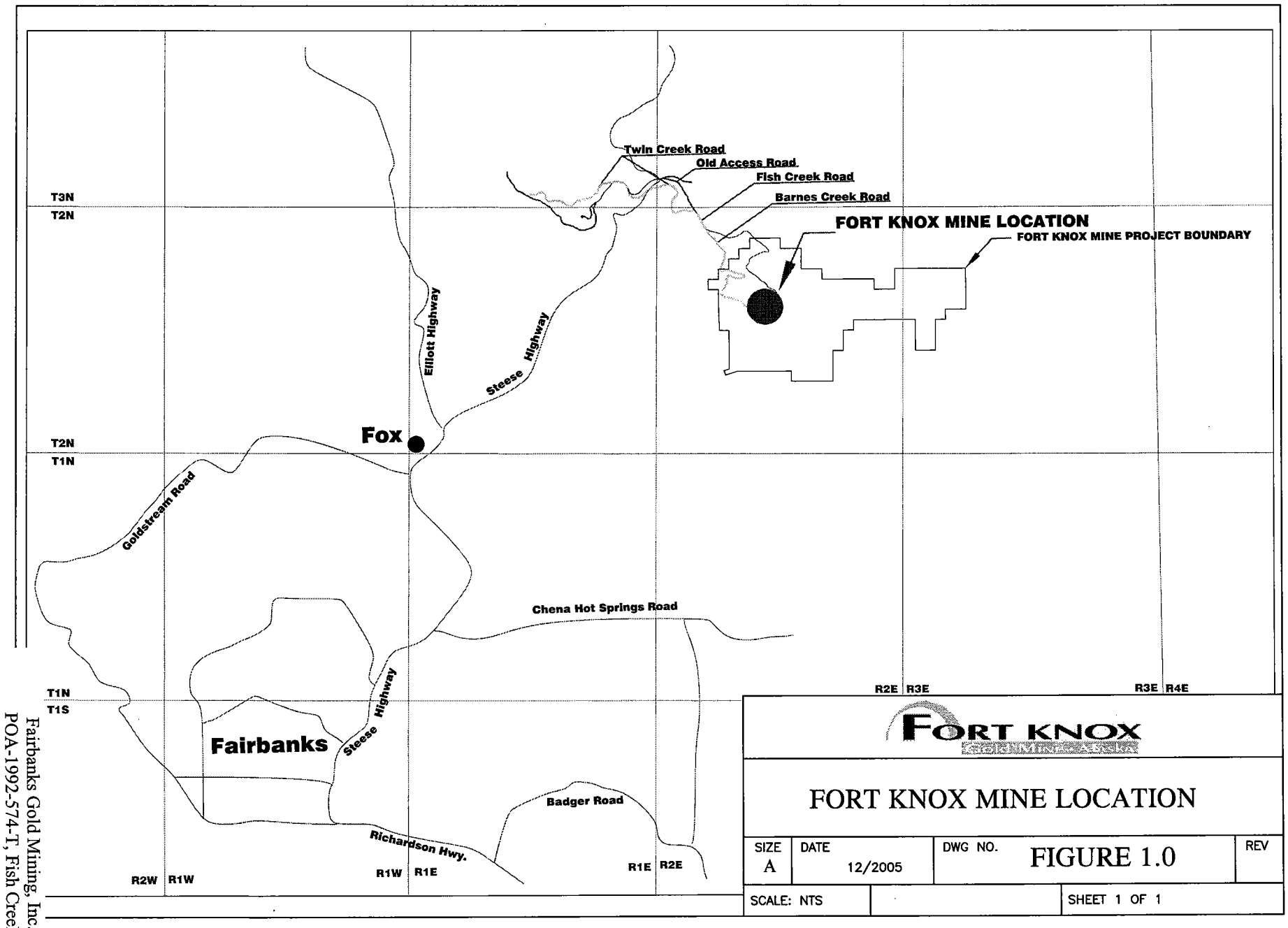
1.1 Purpose

Fairbanks Gold Mining, Inc. (FGMI), a wholly owned subsidiary of Kinross Gold Corporation (KGC), has prepared this reclamation and closure plan to address reclamation, monitoring and post-mining land use for the Fort Knox Mine. This plan is submitted to:

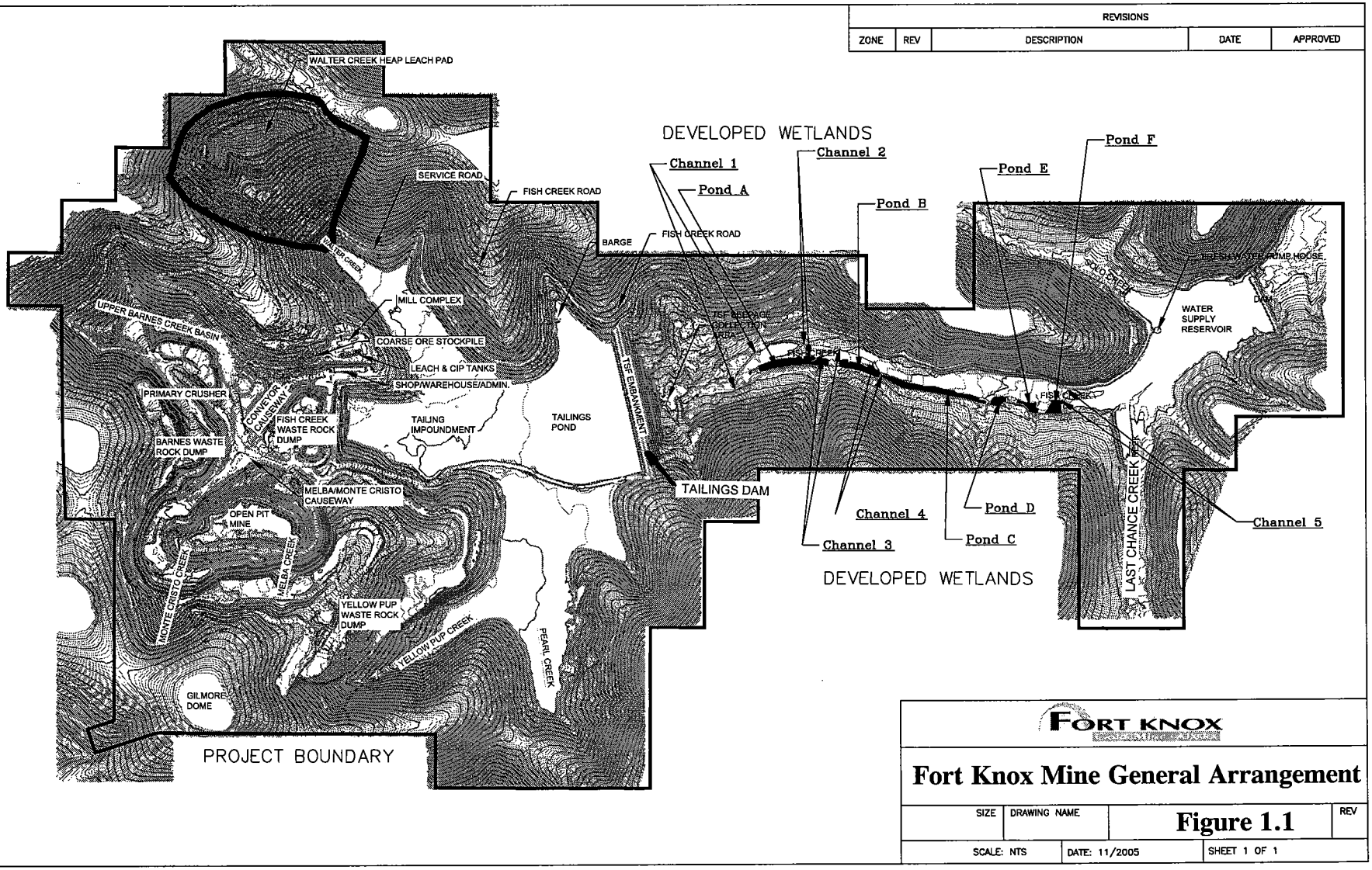
- Alaska Department of Natural Resources, Division of Mining (ADNR) in accordance with AS 27.19.010 et. seq. and 11 AAC 97.100 et. seq.
- Alaska Department of Environmental Conservation (ADEC), Division of Air and Water Quality, as required by Solid Waste Permit #0031-BA008
- U.S. Army Corps of Engineers (ACOE) as required by the Clean Water Act Section 404 Permit No. N-920574, Fish Creek 23

The Fort Knox Mine reclamation and closure plan is designed to return land disturbed by mining and ore processing operations to a stabilized, near-natural condition that will ensure the long-term protection of land and water resources. Additional goals include: minimizing the effects of disturbance during mining, implementation of concurrent reclamation where appropriate, minimizing or eliminating long-term management requirements, and meeting state and federal regulatory requirements. The plan describes the schedule for reclamation, general reclamation procedures, and methods for achieving the final closure requirements and objectives. In addition, the plan serves as a basis for calculating reclamation costs (Section 10), the cost for long-term post-reclamation maintenance obligations (Appendix A), and the adjustment of financial assurance.

Final reclamation, which includes contouring of waste, dumps, tailing impoundment, facility sites, heap leach pad, and revegetation of all disturbance will be initiated immediately upon cessation of mining and milling operations. Reclamation will be completed as expeditiously as feasible. Initial reclamation is anticipated to be completed in two to three years following completion of mill production. Notification, in writing, of final closure will be provided to the ADNR and COE within 90 days after cessation of mining and milling operations (Millsite Permit ADL 414960 &ADL 414961, Item #15).



Fairbanks Gold Mining, Inc.
POA-1992-574-T, Fish Creek
Plans prepared: June 23, 2006, by S. Seim


REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
WALTER CREEK HEAP LEACH PAD
SERVICE ROAD
FISH CREEK ROAD
DEVELOPED WETLANDS
Channel 1
Channel 2
Pond A
Pond B
Pond E
Pond F
BARGE
FISH CREEK ROAD
MILL COMPLEX
UPPER BARNES CREEK BASIN
COARSE ORE STOCKPILE
LEACH & CIP TANKS
SHOP/WAREHOUSE/ADMIN.
PRIMARY CRUSHER
CONVEYOR CAUSEWAY
FISH CREEK WASTE ROCK DUMP
BARNES WASTE ROCK DUMP
TAILING IMPOUNDMENT
TAILINGS POND
TSF EMBANKMENT
TAILINGS DAM
MELBA/MONTE CRISTO CAUSEWAY
OPEN PIT MINE
MONTE CRISTO CREEK
MELBA CREEK
YELLOW PUP WASTE ROCK DUMP
YELLOW PUP CREEK
PEARL CREEK
GILMORE DOME
PROJECT BOUNDARY
Channel 4
Channel 3
Pond D
Pond C
DEVELOPED WETLANDS
WATER SUPPLY RESERVOIR
DAM
FISH CREEK
LAST CHANCE CREEK
Channel 5
FORT KNOX
Fort Knox Mine General Arrangement
SIZE
DRAWING NAME
Figure 1.1
REV
SCALE: NTS
DATE: 11/2005
SHEET 1 OF 1

3.0 FORT KNOX WETLANDS

3.1 Jurisdictional Wetland Survey

American North/EMCON, Inc. conducted fieldwork in 1990 and 1992 to map the jurisdictional wetlands within the Fort Knox Project area. The resulting survey (American North/EMCON, 1992) showed that historical mining had occurred within the five drainages in the project area. All five drainages were disturbed to some degree by historical or recent mining activity. Disturbance had altered some wetlands to the point they no longer meet regulatory criteria for wetlands. As of August 1992, 2,526 acres met the definition of wetlands. Tables 3.0 and 3.1 summarize the jurisdictional wetlands identified in 1992.

Table 3.0 Jurisdictional Wetlands Summary, 1992

Total Project Footprint	4,640 acres
Uplands	-3,307 acres
Non-Jurisdictional Wetlands	-222 acres
Total Jurisdictional Wetlands	1,112 acres

Table 3.1 Jurisdictional Wetlands Breakdown, 1992

Undisturbed Wetlands	784 acres
Historically Disturbed Sites	172 acres
Recently Disturbed Areas	133 acres
Existing Sediment settling Ponds	23 acres
Total Jurisdictional Wetlands	1,112 acres

3.2 Department of the Army Section 404 Permit

In May 1994, Department of the Army Permit No. 4-920574, Fish Creek 23, was issued by the U.S. Army Engineer District, Alaska to FGMI. It allowed the disturbance of 377 acres of wetlands and the discharge of approximately 4,526,140 cubic yards of fill into approximately 103 acres of waters of the United States in conjunction with mining activities. In mitigation for the disturbance, Special Condition 9 of this permit requires that FGMI reclaim the tailing material deposited behind the embankment in proportions listed in Table 3.2. Exhibit E, of Permit No. 4-920574, Fish Creek 23 also prescribes additional mitigation (approximately 46 acres) of the historically disturbed area below the tailing embankment and 165 acres as the footprint of the Water Supply Reservoir including the stilling basin.

Table 3.2 Mitigation Requirements for tailing impoundment Required by 404 Permit

35% Wetlands	424.5 acres
35% Ponds	424.5 acres
30% Uplands	364 acres
Total	1,213 acres

3.3 Fish Creek Valley Developed Wetlands Delineation

To begin fulfilling mitigation requirements of the Section 404 permit, creation and enhancement of wetlands and other waters on the Fort Knox Mine site began in 1997. Old existing placer workings along the south side of the Fish Creek Valley were modified to pond water in the area between the tailing monitoring wells and the upper limit of the water supply reservoir (Figure 1.1). These wetlands and ponds were designed to offset wetland impacts from previous disturbance and the construction of project components. In addition, this wetland area was created to assist in the enhancement and maintenance of the long-term water quality in Fish Creek. Development and enhancement of the wetlands included construction of new ponds and improving existing ponds. A total of six ponds were developed that promoted development of wetland vegetation (emergent, riparian shrub scrub and forested).

Specific Criteria:

- Re-contouring of placer mining disturbances has established a series of channels, wetlands and shallow ponds in Fish Creek between the tailing impoundment and the water reservoir.

- Organic material cleared from past placer mining activities was placed in designated portions of the ponded areas to aid in the re-establishment of vegetation.

- Natural invasion by native species was encouraged and has been successful in the creation of this wetland.

- Flow-through structures have been designed as passive sediment traps and to decrease velocity of channel flows sufficiently to prevent down cutting and channel migration.

- Continuous monitoring of these structures allows for modification and improvement prior to final closure. The flow regime through these developed wetlands will remain fairly constant throughout the mine life and after final closure.

The development and enhancement of wetlands and water resources include:

- A series of wetlands and connecting channels designated as Ponds A-F (Figure 1.1) created in the Fish Creek valley between the tailings dam and the water supply reservoir,

- The water supply reservoir and stilling basin, and

- Last Chance Creek floodplain enhancement activities.

Golder performed a delineation of the developed wetlands (DeFrancesco, 2004) during the periods of July 29 through July 31, 2003 and August 6 through 8, 2003, in accordance with the US Army Corps of Engineers *Wetlands Delineation Manual January 1987*. In terms of overall wetlands and other aquatic sites created, FGMI has to date developed a total of 204.8 acres, including wetlands below the tailings dam and the water reservoir with its associated wetlands. Wetlands and other aquatic sites created by FGMI below the tailings dam were primarily aquatic (pond) sites surrounded by Palustrine Scrub-Shrub (PSS) wetlands. The water reservoir and associated wetlands (including the stilling basin) are primarily open water sites surrounded by Palustrine Forested wetlands and PSS wetlands. The water reservoir and associated sites created by FGMI total 184.3. Additional habitat enhancement on Last Chance Creek which flows into the water reservoir was completed by FGMI and was non-prescribed. Neither the lake within the pit, nor the wetlands/ponds/uplands on the reclaimed tailing impoundment, have been created to date, but they are planned for development upon mine closure. Currently the final pit lake is projected to be approximately 150 acres. Table 3.3 summarizes the current status of wetlands development/enhancement as compared to what is required by the 404 permit.

Table 3.3 Wetland Acres Created/Enhanced and 404 Permit Prescribed Mitigation Acres

Reclamation Type	404 Permit* Prescribed Acres	Created Acres	Additional Acres Needed
DA Permit Special Conditions for Reclaimed Tailings Impoundment (Combination of wetlands/ponds)	425 ac pond 425 ac. wetland	**	425 ac pond 425 ac. wetland
Below the Tailings Dam	45 acres	20.5	24.5
Lake within Pit (not required by 404 permit)	148 acres	**	148
Water Reservoir and Associated Wetlands (Includes Stilling Basin)	165 acres	184.3	-19.3
Additional Habitat Enhancement (Last Chance Creek)	NA	Fish passage and spawning improvements	NA

* Based on Department of Army Permit issued in 1994
** Indicates activity not yet completed by FGMI

The acres of wetlands and open water to be developed through implementation of the currently proposed reclamation and closure plan are provided in Table 3.4.

Table 3.4 Summary of Wetland and Open Water Acres To Be Created

Facility	Open Water	Wetlands
Fort Knox Pit Lake	148	
TSF Open Water	481	
Water Reservoir and Associate Wetlands	184	
TSF Wetlands		286
Fish Creek Wetlands North (Planned)		14
Fish Creek Wetlands South (Existing)		20.5
Total	813	320.5

At present both the pond wetlands and the water reservoir with its associated wetlands are providing fish habitat. ADNR, Office of Habitat Management & Permitting (OHM&P) has conducted annual monitoring of Arctic grayling (*Thymallus arcticus*) and burbot (*Lota lota*) populations in the water reservoir, stilling basin, and created wetlands in Fish Creek since development of the wetlands and reservoir. Successful spawning of Arctic grayling has been documented every year since 1999, and

there is evidence of substantial recruitment to the population. Substantial out migration of Arctic grayling is also occurring to the Chena River system. Information on these fisheries is documented in *Arctic Grayling and Burbot Studies at the Fort Knox Mine, 2005* (Ott and Morris, 2005).

3.4 Developed Wetlands Functional Analysis

An analysis of wetland functions and values was performed as part of the Fort Knox project development strategy in 1993. This pre-development analysis was summarized in a report to FGMI (Buell 1993) and was based in large part on principles and procedures established by the Wetlands Evaluation Working Group (WEWG) within the Joint Pipeline Office originally established to assess

wetlands impacts of the Trans-Alaska Gas Pipeline. Procedures established by WEWG were modified and expanded to better fit the environmental setting of the Fort Knox project. The approach assigned a set of numeric positive (gained) and negative (lost) scores to each wetland area for each of eleven functions/values distributed among three major categories: Aquatic Use Support, Terrestrial Use Support and Human Use Support. This approach corresponded generally to those identified as important for central Alaska by WEWG:

- Water source (quantity)
- Water quality
- Food chain; primary productivity
- Wildlife habitat
- Fish habitat
- Recreation/subsistence
- Vulnerability to disturbance.

These functions and values were rearranged into three major categories and further sub-divided into individual functions: Aquatic Use Support, Terrestrial Use Support and Human Use Support. Scores were awarded according to specific criteria and multiplied by the number of acres in each wetland unit to derive the functional value of the wetland unit.

The 2004 wetlands and aquatic functional value analysis (Buell and Moody, 2004), serves as a *present status* evaluation of the Fort Knox project. However, plans for development of a heap leach project were not envisioned at the time of the evaluation in 2004, and therefore, some modification of the evaluation to account for the heap leach disturbance will be necessary. The approach used in 1993 was also used in the 2004 analysis for comparative purposes. The results of the functional value analysis are summarized by support service category (Figure 3.0) and for each use (Figure 3.1).

Conclusions of the 2004 re-assessment of wetland and aquatic functions and values associated with the Fort Knox gold mine include:

- The current (interim) functional status of most mitigation/restoration measures is nearly at parity with overall functional impacts projected for mine development in the 1993 analysis;
- Functional status of the fresh water reservoir is significantly higher than projected in all use support categories;
- Significant opportunities exist within some areas for additional wetland and aquatic feature functional gains;
- Functional gains remaining as an obligation for FGMI, either under its final reclamation plan (to be implemented upon mine closure) or by means of additional interim mitigation/restoration measures, are relatively minor compared to gains made to date;
- Very significant opportunities remain within the tailings disposal area and the all other areas to exceed the wetlands functional status; and
- By any reasonable measure, the Fort Knox project is very significantly ahead of schedule in terms of meeting its mitigation obligations for wetlands functions and values.

A letter from ACOE, dated June 22, 2005, accepted the rational and current accounting of the wetlands and aquatic functional value analysis. The letter noted that the current accounting of functions provides FGMI flexibility in the final reclamation design for the tailing impoundment and mine site.

3.5 Heap Leach Wetland Impacts

In 1992, a jurisdictional wetland survey was completed for the Fort Knox Project. Additional acreage has been identified based on current conditions and current regulations. Figure 3.2 illustrates the planned heap leach pad and the 54.7 acres of jurisdictional wetlands that will be impacted by the pad. An additional 2.91 acres of jurisdictional wetlands identified on figure 3.2 will be disturbed by roads and pipelines to be constructed in conjunction with the heap leach pad. Within the footprint of the heap leach pad, 15.3 acres of wetlands were previously permitted to receive fill as part of the tailing impoundment.

Figure 3.0 Summary of Wetland Functional Scores by support service category (Buell and Moody, 2005)

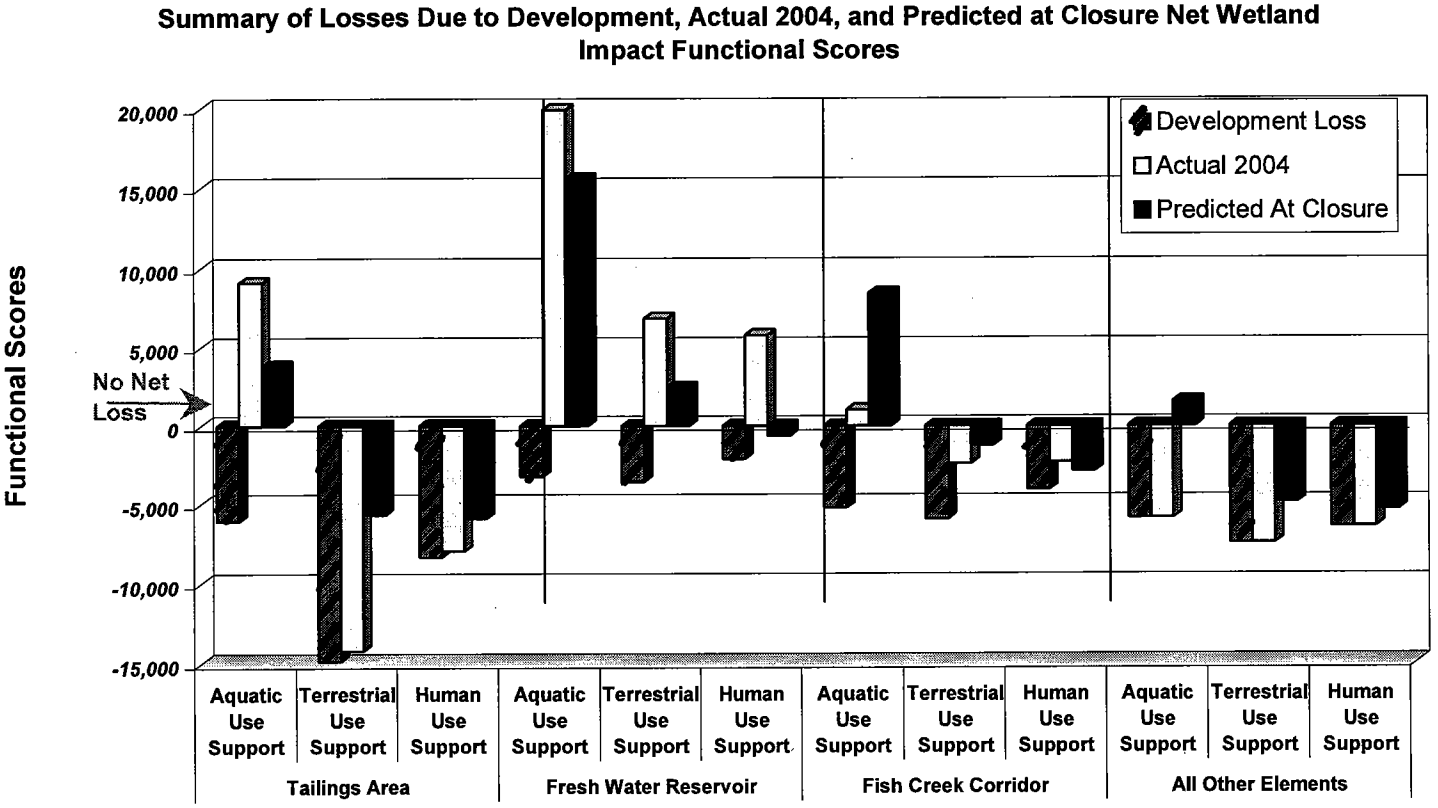
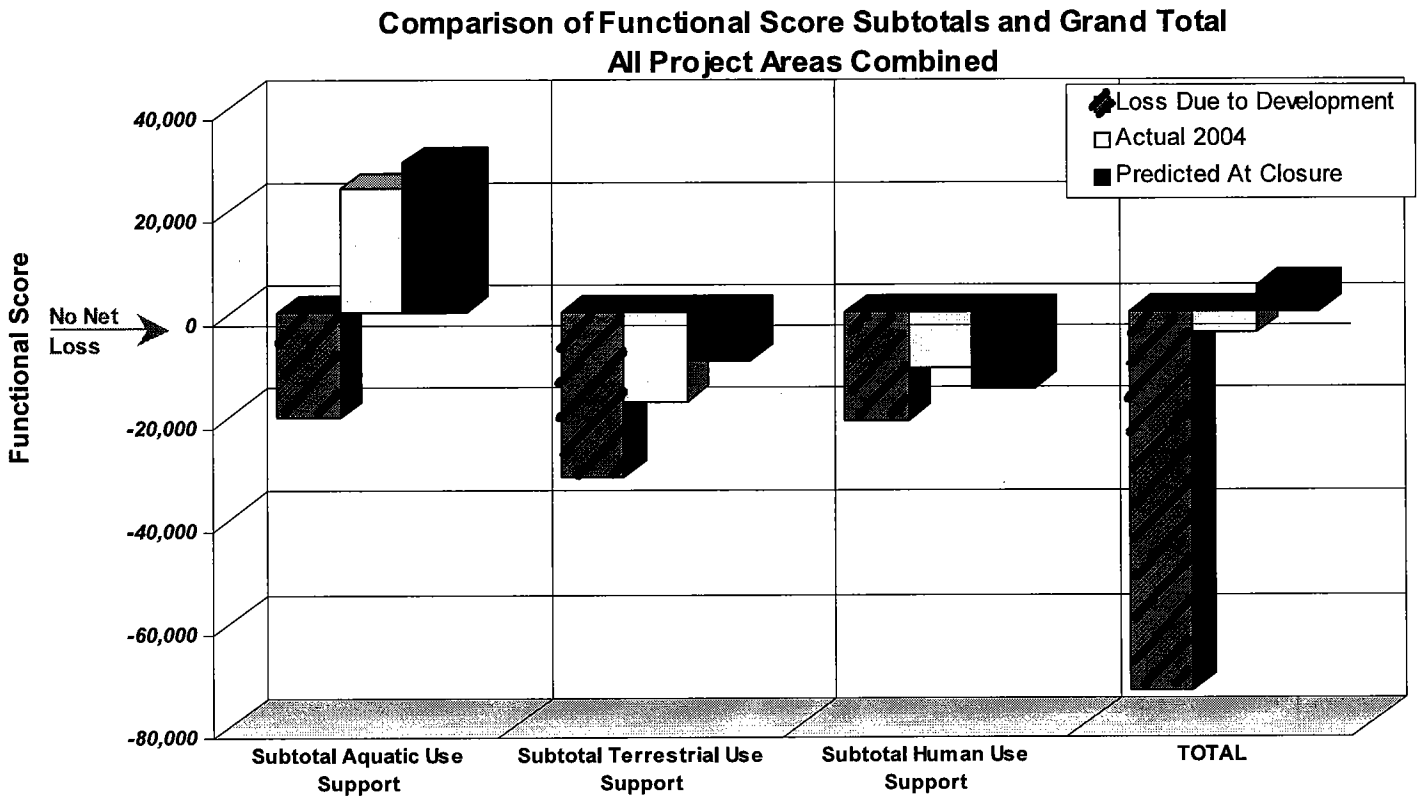
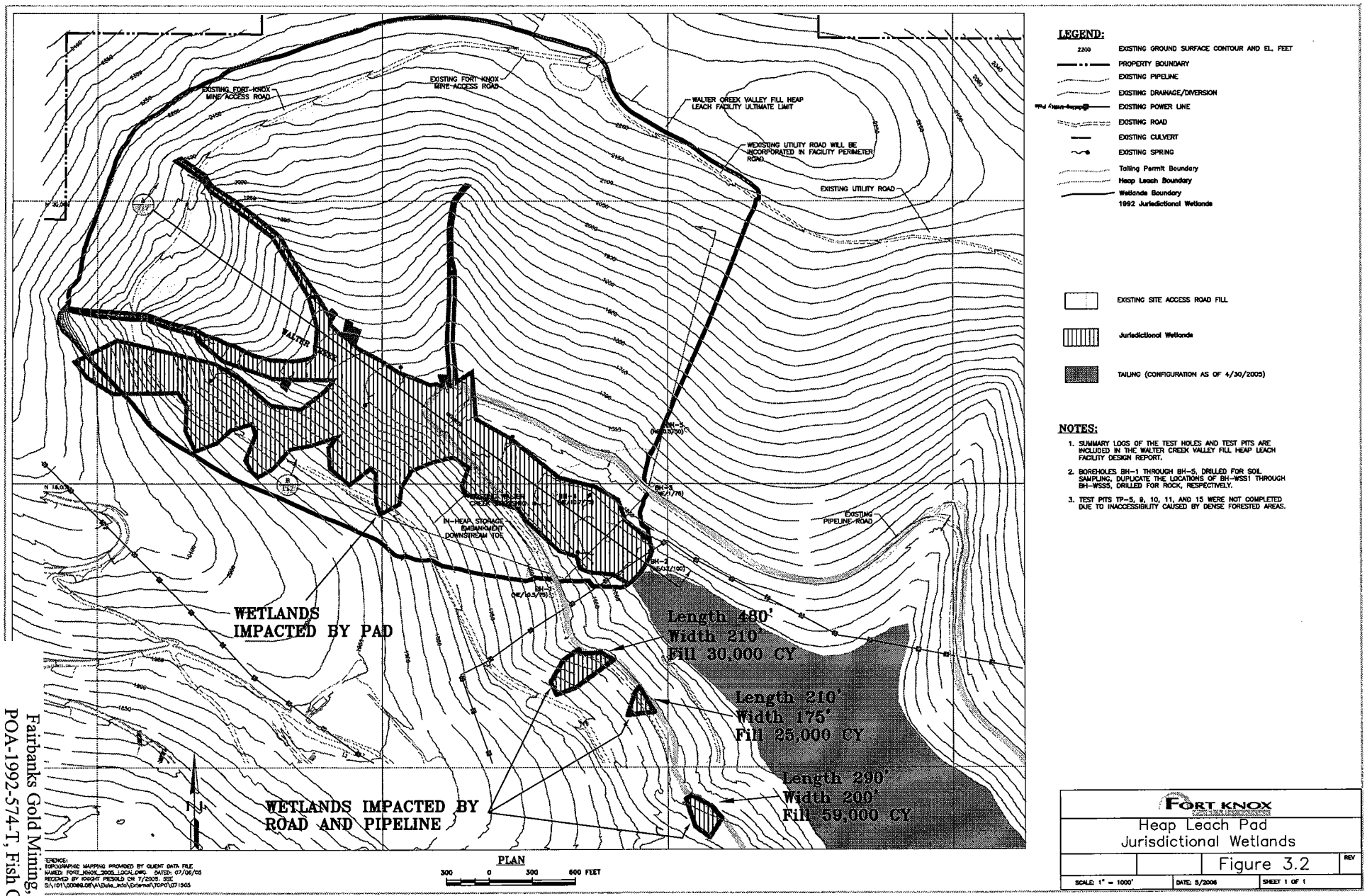


Figure 3.1 Comparison of Functional Scores by use (Buell and Moody, 2005)





Fairbanks Gold Mining, Inc.
POA-1992-574-T, Fish Creek
Plans prepared: June 23, 2006, by S. Seim

5.4 Public Access

Public access to the Fort Knox site will be restricted until reclamation and closure are completed. Once FGMI relinquishes the Millsite Lease property in accordance with the *Agreement For Funding Post-Reclamation Obligations* (Appendix A), public access to the Fort Knox site will be managed by the State of Alaska. The existing Fish Creek road will remain to provide access to the water supply reservoir. Roads to be left in place following completion of reclamation will be determined by ADNR and MHTLO.

Public safety is a principal concern in closure and reclamation of mining operations. The Fort Knox pit high wall interceptor ditches and safety berms will remain in place to restrict access to the pit area along Gilmore Dome. Generally, berms four to six feet in height will be utilized to restrict access to the steeper highwall sections of the pit and other potentially hazardous areas. Signs will be posted to provide additional warning of potentially hazardous areas.

6.0 FACILITY SPECIFIC RECLAMATION AND CLOSURE

The reclamation and closure activities specified for each mine facility have been chosen to attain two goals:

- establishment of a stable, self-sustaining vegetated surface consistent with post-mining land uses; and
- creation of conditions that ensure the water quality of site runoff and drainage protect post-mining beneficial uses of water.

Operational performance has confirmed the pre-mining test results indicating no potential for acid rock drainage or significant metals mobility in Fort Knox ores. In the long term, the general reclamation activities described in Section 4 are directed at creating self-sustaining vegetation

communities on tailings, heap leach pad, and waste rock dumps that will provide protection for water resources.

Immediately after closure not all site runoff and drainage will meet water quality standards for all designated uses. In particular, this is true of tailings and heap water compared with water quality standards established for aquatic life. A comprehensive water balance model approach has been used to evaluate the reclamation alternatives for specific facilities. Based upon the results of this evaluation, an overall, integrated water management and reclamation strategy has been developed to ensure runoff and drainage water quality will not adversely impact designated use standards in the receiving water. The objective of this strategy is to allow Fort Knox to achieve the designated post-mining land uses as soon as possible after mining and milling are finished.

6.1 Water Management

The goal of the water management plan will be to protect designated use standards in the receiving water. The strategy outlined is based on model predictions, and as such, it will be subject to review and refinement during the closure period when actual conditions become known.

Receiving Water Beneficial Use

By default, natural waters in Alaska are protected for all designated uses established by regulation. Prior to construction of the Fort Knox mine, baseline water quality in Fish Creek was affected by naturally occurring iron, manganese, and arsenic as well as by extensive alluvial placer mining operations, with seven parameters having values exceeding the state maximum contaminant levels for drinking water, and three others just below those levels (CH2M Hill, 1993). Since construction of the mine, surface water quality in Fish Creek has improved, in large part due to successful reclamation of pre-existing placer mining disturbance in the Fish Creek drainage between the Fort Knox tailings storage facility and the fresh water reservoir. The Fish Creek water supply reservoir now supports a robust population of grayling and burbot (Ott and Morris, 2005).

Mine Site Surface Water

In comparison to the water supply reservoir, the tailing impoundment is considered a treatment facility during operation and closure. It is operated as a zero discharge facility, and as such the water quality standards for the state's designated uses do not apply (CH2M Hill, 1993, p 4-27). As outlined in the original EA (CH2M Hill, 1993) for the project, the use of the water pool in the tailing impoundment as a habitat resource for wildlife (fish, migratory birds, and mammals) would be considered only after reclamation is complete, depending on characterization of the tailings during operations (CH2M Hill, 1993, p 2-70).

Water Management Consultants (2005a) has evaluated observed water quality trends to date and predicts that the water quality of the water pool in the tailing impoundment, pit lake, and heap leach drainage will meet the water quality standards for discharge except for some constituents in which the natural condition of the groundwater and surface water in Fish Creek is of lower quality than the criteria for discharge. As a result, site-specific criteria for some constituents that take into account background conditions as outlined in 18 AAC 60.825 may be appropriate. These regulations outline the methodology for establishing tolerance intervals that the owner/operator of a solid waste facility must utilize to evaluate potential changes in groundwater quality.

Once water quality standards for discharge are met, site runoff and drainage will be discharged to a wetland treatment system that will provide a final polishing treatment. The wetland system will not be the primary means utilized to meet water quality standards. All water reporting to the wetlands will meet standards prior to discharge from the tailing impoundment. No seepage water is planned for a surface discharge. When standards are achieved, the mine will enter the post-closure monitoring phase. Incorporation of the wetland system will not influence the post-closure monitoring period since it is planned to receive water that meets water quality standards. However, through the years of post-closure monitoring and thereafter, the benefits of the wetland will available to be taken advantage of if needed.

Summary Water Management Strategy

Using the comprehensive water balance model developed for closure planning, the key activities designed to protect all designated uses in the water supply reservoir on Fish Creek are as follows:

- At closure, the tailings decant pond will initially be dewatered by pumping to the pit during which time the inflow of runoff water will mix with the decant water to improve quality. Pumping will maintain the pond elevation such that sufficient storage volume will be available to contain the 100-yr 24-hour storm event and spring runoff volume with the required amount of freeboard.

- During this time, the seepage collection system will continue to operate and provide containment resulting from a contiguous cone of depression at the toe of the facility. Therefore the tailing impoundment will continue to function as a "zero-discharge facility" until the seepage will not cause exceedances of water quality standards at the downgradient monitoring location.

- After approximately two years, pumping to the pit will be discontinued and fresh water will be allowed to create a water pool on the tailings.

- By the time the fresh water pool is allowed to reach the spillway elevation, water quality

in the pool will meet standards for discharge, and water will be allowed to flow by gravity to a series of wetland pools to be constructed below the tailings.

- The wetland treatment system will be designed to provide physical separation from the existing wetland system of overflow from the fresh water pool on the reclaimed tailings,. The wetland system will provide contingency treatment capacity in order to ensure the discharge will not affect designated uses in the freshwater reservoir. However, it is not intended that the wetlands would have to function in a manner to meet water quality standards prior to discharge at the Freshwater Reservoir.

- At the point in time when the tailings decant pond is dewatered and the process of developing a fresh water pool on the tailings begins, seepage collection at the toe of the tailings will be discontinued, provided that this will not impact designated uses of surface water in Fish Creek. Prior to that time, contingencies will be developed if needed for in-situ groundwater treatment of the seepage.

- When heap leaching is complete, rinse and/or recirculation water will be applied to the spent ore until the water quality of the drainage is such that drainage can be allowed to flow by gravity to the fresh water pool on the tailings without impacting water quality standards.

- During rinsing and initial draindown of the heap, some water may be directed to the pit.

- The amount of water pumped to the pit from the tailing and/or the heap leach will be limited by the chemical mass in the water pumped to ensure that the pit water meets water quality standards when the pit lake achieves final elevation.

- Directing water from the tailings decant pool and possibly from the heap leach pad will accelerate the filling process for the pit. Without these measures, modeling estimates it will take approximately 100 years to fill the pit to its long-term stable water elevation (Doubek, 2004). With these measures, modeling estimates filling will take approximately 80 years, and will result in lake water quality that meets the water quality standards for discharge (Water Management Consultants, 2005a).

6.2 Tailing Storage Facility Reclamation & Closure

The tailing impoundment and associated appurtenances are permitted under Solid Waste Disposal Permit 9331-BA008 by ADEC for the operation, closure (reclamation), and post-closure monitoring.

Reclamation goals for the tailings impoundment are as follows:

- Allow the tailings to consolidate;
- Establish a mixture of aquatic, wetland, and upland habitat;
- Ensure that water quality meets applicable standards as described in Section 6.1.

Based on the analyses presented in the report *Fort Knox Mine Tailing Facility Closure Management Plan* (Water Management Consultants, 2005a), a closure plan has been developed that describes the activities that will be performed to allow final stabilization of the tailing. Closure activities will begin when production from the mill ceases. Major earthwork for the reclamation and closure of the tailing will be completed within 3 years.

Closure Sequence

Reclamation of the tailings impoundment will be integrated with the overall mine water management strategy. Operational measures during the last two to three years of mill production will be implemented to prepare for efficient closure of the tailings once milling is complete.

- During operations, tailings will be deposited from the upstream face of the tailings dam in order to create a "beach" along the dam. This will push the decant pond away from the dam, reducing the amount of seepage through the dam and eliminating conditions of standing water against the dam.
- During operations, use of fresh water for process make-up needs will be minimized or eliminated so that, by closure, the volume of water in the decant pond will be reduced to the operational minimum.
- At the point in time when mining and milling are complete, the volume of water remaining in the pond will be further reduced by pumping water to the pit. It is anticipated that water would be pumped to the pit over a period of two years, at which time there would be a very small pond left on the tailings.
- A fresh water pond would be established on the tailings in order to bring the water level to the level of the closure spillway. The source of fresh water for the closure pond would be runoff from areas upgradient of the pond.
- Based upon long-term average climate conditions, it is expected that the pond level would reach the proposed spillway elevation after approximately 12 years.
- After the fresh water pond fills to the spillway elevation, water would be discharged to

the wetland treatment system. The level of water in the pond would fluctuate by about 4 feet annually.

- The surface of the tailings not covered by water will be reclaimed to include upland (dry cover), and a transition zone of wetland vegetation within the zone of annual water level fluctuation.

Tailings Surface

Establishment of the final tailing surface was initiated in June, 2005 when the tailing discharge spigot was moved to the east part of the causeway in order to begin establishing the beach adjacent to the upstream face. This will begin to push the decant pond away from the embankment face toward the west. Based on current projections, the final tailing surface will have elevations ranging from about 1,488 ft amsl to a low point less than 1,460 ft amsl. The beach on the upstream face of the embankment will vary between 300 and 500 ft wide.

The closure spillway invert elevation will be designed to coincide with the final tailings surface elevation along the north abutment of the dam. Based on the final tailings surface as currently projected, the total storage volume of the final surface will be approximately 5,500 acre-ft at a spillway invert elevation of 1,485 ft amsl (WMC, 2005a). The pond elevation will fluctuate annually. The size of the water pool will vary from approximately 400 acres to 600 acres. The spillway will be designed such that water will not be impounded immediately adjacent to the dam face at any time after closure.

Areas that will be saturated at least part of the year due to seasonal water level fluctuations (currently projected to be about 286 acres) will be revegetated to support wetland species. Figure 6.2 illustrates the distribution of open water, wetland and upland habitat as projected.

Upland vegetation will be established along the margins of the facility where tailing have dewatered sufficiently to allow access (166 acres). Reclamation of upland areas will utilize the general reclamation techniques described in Section 4. If trial plots prior to final closure demonstrate than vegetative cover can be established without the use of growth media, none will be used. If growth media is required, placement will commence once the tailings have consolidated sufficiently to allow equipment access, and revegetation with the upland seed mix will follow. If additional growth media is required to establish a vegetative cover, select areas directly above the final tailings will be partially stripped of organics and growth media to be spread over the tailings surface. This reclamation method will provide suitable growth media, woody debris on the tailings surface, and open the borrow areas to the establishment of early succession vegetation (grasses and willows) that has a higher habitat value for the larger terrestrial species present at the site.

ZONE	REV	DESCRIPTION	DATE	APPROVED

REVISIONS

	Calculated areas (acres)	Elevation from final tailing surface topography (ft amsl)
Upland vegetation	166	1490
Wetland vegetation	286	1486
Open water	481	1484

N

0 1000 2000
Scale in Feet

EXPLANATION

Open water

Wetland vegetation

Upland vegetation

FORT KNOX

PLAN VIEW OF TAILING RECLAMATION AND REVEGETATION MAP

SIZE	DWG NO.	FIGURE NO. FIGURE 6.2	REV
SCALE: NTS	DATE 12/2005	SHEET 1 OF 1	

Tailing Spillway

The tailing spillway, discharge channel and stilling basin have been designed by Water Management Consultants (2005a). The spillway for the tailings impoundment will be a trapezoidal, broad-crested weir designed to safely pass the design storm event (PMP) assuming that the water pool will be at 1,486 ft amsl (i.e. spillway elevation 1,485 ft amsl plus the average spring breakup volume of 950 ac ft) (Water Management Consultants, 2005a). The peak flow and maximum storm volume for the spillway will be 195 cfs and 2,700 ac ft, respectively. The spillway will be excavated in bedrock at the north abutment of the dam. The channel conveying flow from the spillway will be routed to the existing pond located at the toe of the tailing. The channel will be armored with rip rap where necessary to prevent erosion. Figure 6.3 illustrates the location of the spillway, channel, stilling basin, and wetland treatment system.

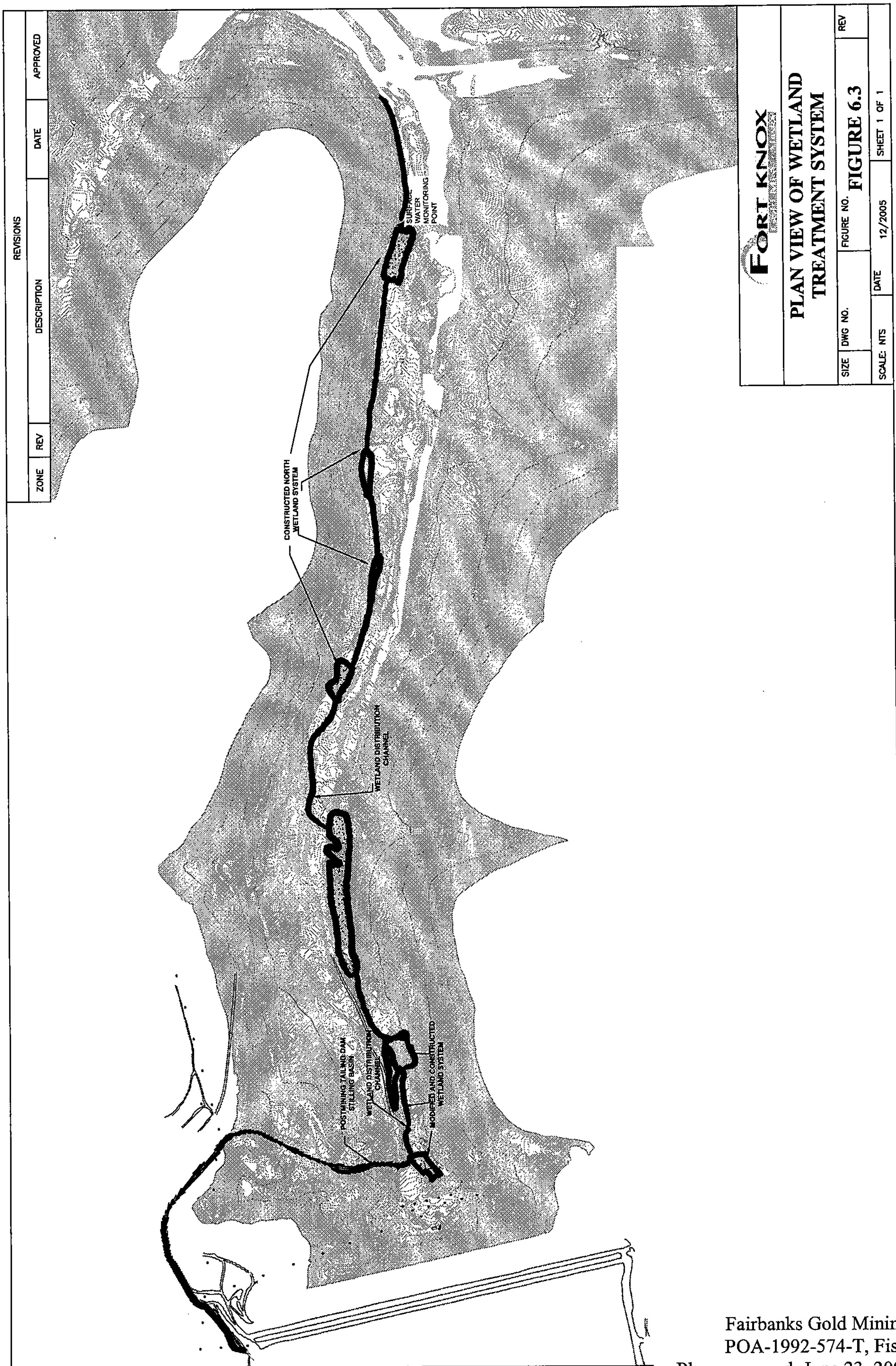
Wetland Treatment System

There will be no discharge from the tailing impoundment until after the fresh water pond is established and reaches the proposed spillway elevation. When the pond level reaches the spillway elevation, the water in the pond will be derived almost entirely of natural runoff and drainage from reclaimed surfaces that meets the water quality criteria for discharge. While all discharge will meet water quality standards, as a contingency measure, a wetland treatment system will be constructed to provide a final polishing treatment.

The wetland treatment system that will be constructed on the north side of Fish Creek where placer mining has completely disturbed the original stream morphology is illustrated in Figure 6.3. Currently, little to no surface water flow occurs in the area planned for construction of the wetlands. The channel, stilling basin and wetlands to be constructed from the north abutment of the tailing dam along the north side of the valley to the water supply reservoir will be designed to pass spring breakup and storm events. In addition to the additional wetland habitat that will be provided, the design will help to dissipate energy from storm water runoff and minimize impacts from storm events on the developed wetlands located along the south side of the valley. The wetland system will be separated from the grayling ponds on the south side of the drainage by a ridge developed during placer mining.

The wetland system will consist of a series of interconnected detention basins, which will ultimately terminate above the freshwater reservoir (Figure 6.3). A series of retention basins and channels will provide retention volume for sediment control, followed by alternating basin/channel systems to create alternating aerobic/anaerobic conditions for contingency water quality polishing. The wetland treatment system will discharge to the west end of the Fish Creek Reservoir. The monitoring point will be immediately upstream of the reservoir.

The basins will be excavated to depths ranging from 3 to 6 ft depending on the local topographic gradients. The total storage capacity of the detention basins is approximately 5 to 7 acre-ft. The


REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
SURFACE WATER MONITORING POINT
CONSTRUCTED NORTH WETLAND SYSTEM
WETLAND DISTRIBUTION CHANNEL
POSTMINING TAILING DAM STILLING BASIN
WETLAND DISTRIBUTION CHANNEL
MODIFIED AND CONSTRUCTED WETLAND SYSTEM
FORT KNOX
PLAN VIEW OF WETLAND TREATMENT SYSTEM
SIZE
DWG NO.
FIGURE NO.
FIGURE 6.3
REV
SCALE: NTS
DATE
12/2005
SHEET 1 OF 1

geometry of the basins has been defined based on the existing topography and the gradient of the drainage. The conveyance channel interconnecting the basins will be approximately 14-ft wide with a trapezoidal section. The channel side slopes will be 3H:1V. It is likely that the channel bottom will be comprised of placer tailings (coarse gravel to cobbles) and will not require significant armoring or erosion control. Riprap will be placed where local ground conditions require stabilization and erosion control.

The contoured slopes along the edges of the wetland treatment system will be seeded and fertilized to encourage natural invasion of native species. Willow cuttings will be planted along the edges of the constructed wetlands where appropriate hydric soils exist. The various detention ponds of the wetland treatment system will be planted with a mixture of wetland plant sprigs and/or seed of commercially available native species of sedges, rushes, wetland grasses, iris, bulrush and cattail where water depth is appropriate for each species.

Tailings Embankment

The downstream face of the tailings embankment is constructed of durable rock, and is resilient to erosion. The downstream face of the tailing embankment will not be capped with growth media. The armored slope that remains will be stable, will not be subject to erosion and will not support vegetation that could potentially compromise the integrity of the dam.

6.3 Seepage Interception System

The water quality in the seepage interception system is influenced by natural groundwater conditions, and by seepage from the tailings impoundment. Water Management Consultants has developed a water balance / water chemistry model that accounts for the natural groundwater chemistry, the chemistry and volume of seepage, the hydraulic effects of beach development and creation of a fresh water pool on the tailings after closure (Water Management Consultants, 2005a). The model indicates that development of a tailings beach, as described in Section 6.2, will reduce the rate of seepage from the tailings and consequently improve seepage water quality in the short term. Seepage water quality is predicted to further improve in the initial period following cessation of operations. During the initial closure period, the seepage interception system will continue to operate, and the seepage water will be pumped to the pit as the tailings decant pool is dewatered. During this time sufficient storage capacity will be available to contain the 100-year, 24-hour storm plus spring runoff with the required freeboard. At the point in time when the decant pond dewatering is complete and the process of developing a fresh water pool on the tailing begins, seepage collection at the toe of the tailings will be discontinued based upon a demonstration that the discharge criteria has been achieved and is approved by ADEC.

If during the initial closure period water quality trends indicate discontinuation of seepage collection could affect designated uses in the water supply reservoir, additional test work and

characterization will be conducted to develop contingencies. Contingencies would most likely involve development of a passive treatment zone within the groundwater flow path downgradient of the tailings dam. The parameters currently above drinking water standards (e.g. sulfate and nitrate) are amenable to treatment using bacteriological activity to create anaerobic conditions. In groundwater applications this can be accomplished by injecting an organic food source (methanol or other) into the groundwater flow path, or by excavating an interception trench and backfilling the trench with an organic mixture.

Closure of the seepage collection system will include:

- discontinuation of pumping from the seepage collection gallery and wells;
- removal of pumps, piping, and surface structures for salvage or disposal;
- backfill of the collection gallery using alluvial material;
- plugging and abandonment of the seepage collection wells per regulation.

6.4 Pit Lake

Based on the estimated water quality pumped from the tailing impoundment and the anticipated pit inflow quality, the final pit lake quality is expected to meet compliance standards by the time discharge occurs. Exceptions will likely include manganese and iron, which have background concentrations above standards. Pre-mining iron concentrations in surface water ranged from 9.5 to 17 mg/l. Current concentrations measured in the wetlands ranged from 2 to 30 mg/l. Manganese concentrations ranged from 0.3 to 0.4 mg/l in Fish Creek prior to mining. Current concentrations are similar in magnitude; therefore, these constituents will not degrade existing water quality. Table 6.0 provides a summary of the expected pit lake quality at the time of closure. The estimates are based solely on conservative mixing calculations and do not account for stratification or reactions that would likely result in lower concentrations (WMC, 2005a).

Table 6.0 Predicted pit lake quality at full recovery

Parameter	Standard (mg/l)	Pit lake concentration (mg/l)
As	0.01	0.009
Sb	0.006	0.005
CN (free)	0.0052	0.002
SO4	250	50
TDS	500	145
Cd	0.0003	0.0002
Cu	0.009	0.007
Se	0.005	0.005
Zn	0.12	0.009

6.5 Heap Leach Closure

The proposed method of closure for the Fort Knox heap leach pad is based on site-specific conditions, facility design, currently available test work, and the technical analyses completed as part of this project evaluation. The supporting data and concepts for the closure of the heap leach pad is provided in *Fort Knox Mine Closure Management Plan for Proposed Heap Leach Facility* (Water Management Consultants, 2005b). Key aspects of the site and operation that are considered for closure include the following:

- The climate at the site is characterized by moderate precipitation, moderate evaporation, and cold temperatures. As a result, the long-term drainage from the pad after closure is predicted to be minimal.

- Laboratory test work shows that cyanide concentrations will decrease rapidly through recirculation with freshwater if reagents are not added to maintain process-level concentrations.

- The tailing is located directly downgradient from the proposed heap leach pad and will be used as an integral part of the long-term solution management scheme.

- To facilitate closure management and if approved by ADEC, a portion of the solution inventory can be directed to the pit or treated once residual leaching is no longer economic. Long-term seepage will be routed to the surface of the tailing.

- The facility will be regraded to an overall 3:1 slope and covered with growth media. The regrading design will include erosion control measures as necessary to avoid loss of growth media.

- Due to the presence of tailing directly downgradient of the heap leach facility, no suitable locations for groundwater monitoring wells exist. The presence of the tailing limits the effectiveness of monitoring wells in detecting potential seepage. However, underdrain quality will be monitored via a well installed through the base platform and into the drainrock. In addition, monitoring will occur in the PCMS* and LCRS# systems during early stages of closure. Post-closure discharge from the drainage system will be monitored.

Heap Leach Closure Procedures And Schedule

The closure schedule will include the following components:

- Residual leaching until uneconomic.

* Process Component Monitoring System

Leachate Collection and Recovery System

- Solution recirculation/rinsing to destroy cyanide and meet compliance standards
- Release of draindown to the tailing impoundment
- Release of minor long-term seepage to the tailing impoundment
- Regrading and cover

Residual Leaching

Following completion of mining in the pit and final placement of ore on the pad, it is anticipated that leaching and gold recovery will continue for one to several years. As the recovery of gold begins to decline, the addition of cyanide will be discontinued. Heap leach pads often continue to economically recover gold for a number of years after the addition of cyanide is discontinued. During this period, barren solution will be applied to recover gold held in inventory. The exact duration of residual leaching will be dependent on continuing gold recovery.

Solution Recirculation/Rinsing

After economic leaching has been completed, solution will continue to be re-circulated on the pad to promote cyanide destruction. No cyanide will be added to the solution during this step. Freshwater will be added to the system as required to facilitate rinsing and removal of metals. Column testing currently underway will provide more detailed information on the quality of rinse water at the completion of rinsing and the time required for rinsing. The column testing will be completed in the summer 2006, and a supplementary report will be prepared to address water quality associated with rinsing. If the data warrants, the closure plan for the heap leach will be modified to address any issues identified.

During the rinsing, it may be necessary to direct solution to the pit or to a treatment facility in order to manage the water balance and remove chemical mass from the system. However, no action will be taken without the approval of ADEC. Routing solution to the pit will improve the effectiveness of rinsing by minimizing the influence of evapo-concentration and reducing cyanide and metals concentrations. Although the chemical mass to be pumped to the pit from heap leach and the tailing is believed to be less than the amount that would compromise the water quality in the pit long term, the chemical mass pumped will be monitored closely, and if necessary, a treatment system will be implemented to reduce the chemical mass going to the pit. Treatment options being investigated include engineered wetlands, reverse osmosis, oxide scavenging, chemical reduction and biologically mediated reduction.

Since there is anticipated to be an extended period of residual leaching without the addition of cyanide and considering the high permeability of the heap leach ore, rinsing will likely be of short duration. The rinsing rate will be 8,000 gpm. The actual duration of this step will be controlled by

the time required for the water quality to achieve discharge standards. Following approval by ADEC, the heap leach water will be released to tailing when the quality meets the standards for discharge to the tailing.

Release Of Draindown To The Tailing Impoundment

Once the compliance standards are met, solution will be directed to the tailing impoundment. The solution remaining in the in-heap storage impoundment will be released to flow to the tailing impoundment by penetrating the primary and secondary liners of the LCRS and the prepared sub-base utilizing a drilling rig. A minimum of three holes will be drilled to allow the solution to drain.

Release of minor long-term seepage to the tailing impoundment

Once the standards for discharge are achieved in the rinse water, the long-term seepage will be directed to the tailing impoundment and managed according to the closure plan for that facility. The surface of the tailing impoundment will be a combination of impounded water, wetland, and upland vegetation (Water Management Consultants, 2005a). Discharge from the heap leach pad will mix with the water impounded on the surface of the tailing impoundment and be subject to further treatment by the wetlands encountered on the tailing surface.

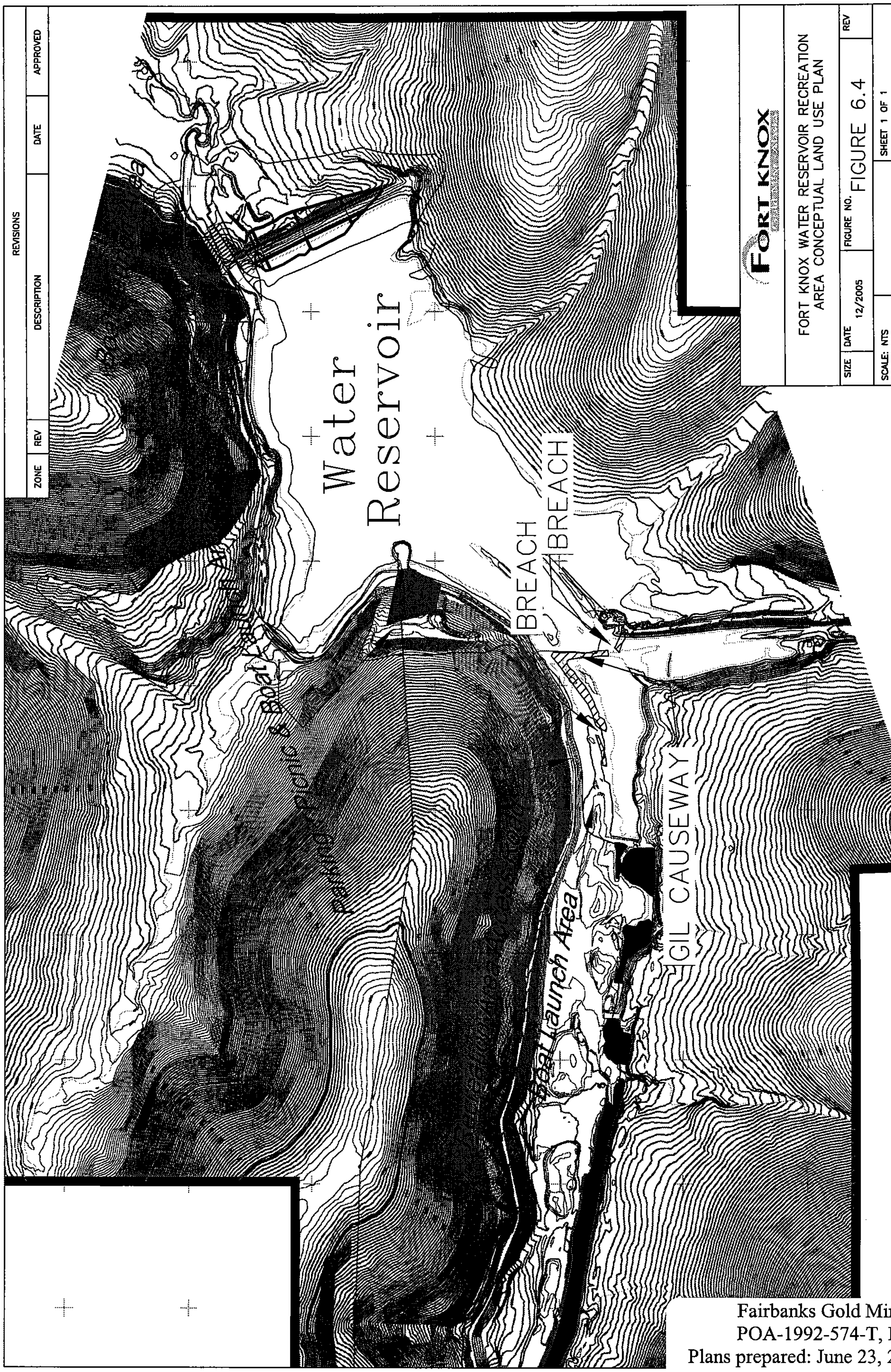
Regrading and cover

Following completion of rinsing, the heap will be regraded to an overall 3H:1V slope. The grading plan will include erosion control measures as appropriate to avoid loss of growth media. A nominal 1 ft soil cover will be placed on the regraded surface. The soil material will be sourced from stockpiles created during foundation preparation. The cover material will be seeded and vegetated subsequent to placement.

6.6 Water Supply Reservoir, Solo Creek Causeway and Gil Causeway

FGMI will leave the water supply reservoir and Solo Creek causeway in place to allow for the long-term use and maintenance of the area as a recreational lake and wetland area (Figure 6.4). Following reclamation and closure of the project process components, the dam, access road and Solo Creek causeway will be maintained according to the terms defined in the *Agreement for Funding Post-Reclamation Obligations* between FGMI, ADNR and ADF&G (Appendix A).

The Gil causeway (Figure 6.4) will be breached to allow the free movement of fish from the main lake body into upper reaches of the lake and Last Chance Creek. The Gil Causeway Reclamation Plan (Appendix D) was submitted to OHM&P on March 29, 2001. It describes the removal of the existing four culverts along the Gill Causeway to restore the original Fish Creek channel as nearly as can be replicated while working below the level of the water in the reservoir. Material removed will be placed along remaining portions of the causeway to create additional shoreline, which will be


Water Reservoir
BREACH
BREACH
GIL CAUSEWAY
Boat Launch Area
Parking / Picnic & Boat
REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
FORT KNOX
FORT KNOX WATER RESERVOIR RECREATION AREA CONCEPTUAL LAND USE PLAN
SIZE
DATE 12/2005
FIGURE NO. FIGURE 6.4
REV
SCALE: NTS
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contoured, ripped and seeded if required. The remaining road surface and safety berms will be graded and revegetated.

The lake will not be available for public use until final reclamation and a period of post-closure monitoring (approximately ten years) is complete and the area is transferred to the State.

6.7 Roads

For purpose of this reclamation plan, FGMI has assumed the following however the roads to be reclaimed will be determined by ADNR and MHTLO*.

- Access to the mine pit and mill areas will be provided via service roads. These roads will consist of the Fort Knox road and a service road from the reclaimed mill site to the pit. Access to the developed wetlands and water supply reservoir will be available using the Fish Creek Road. A service road linking various points within the site will be necessary to provide access for maintenance and long-term monitoring. These permanent roads and access roads are illustrated in Figure 5.4.

- All road acreage not identified in Figure 5.4 is planned for reclamation. However, roads will be individually analyzed by ADNR, MHTLO and FGMI to determine which roads will remain permanently.

- Reclamation procedures will be similar for all types of roads that are to be reclaimed. Culverts will be removed; natural drainage areas restored or stabilized and roadbeds will be graded where necessary to provide adequate drainage. Following grading, roadbeds will be scarified/ripped and revegetated. If determined necessary for successful revegetation, growth media will be placed. Water bars to manage surface runoff and control erosion and berms to restrict human access will be incorporated where necessary.

6.8 Open Pit / Melba Monte Cristo Causeway

During active mining, reclamation activity in and around the open pit will be limited to controlling erosion on the haul roads. Upon final mine closure, haul roads in and around the pit will be smoothed of all berms except those necessary for erosion control and safety. Road cuts and fills will be recontoured as much as feasible, and the roadbeds will be ripped and scarified where necessary. After pit dewatering ceases, the pit will fill with water. The ultimate water surface in the pit will be at approximately 1,470 feet amsl and will cover approximately 150 surface acres. FGMI proposes to divert all flows up gradient of the pit into the pit, where possible, to fill the pit and bring it to a stable condition more rapidly.

* Mental Health Trust Land Office

The Melba/Monte Cristo causeway is constructed of schist and granite bedrock mined from the open pit at Fort Knox. This material, as tested by Knight Piesold during design of the tailing impoundment, has a coefficient of permeability of 560 feet/day (2 x 10-1 cm/sec). Due to the permeable nature of the material in the causeway, any water flowing over the crest of the pit at the original ground surface will continue to flow through the causeway and not be impounded upstream of the embankment. The Melba/Monte Cristo causeway will never impound more than a few feet of water. Since the flow will be subsurface, there will not be a need to establish an outflow channel from the pit lake.

6.9 Waste Rock Dumps

Upon cessation of mining at Fort Knox, the waste rock dumps will contain approximately 200 million tons of overburden and waste rock. Figure 5.4 illustrates the location of the West, Barnes Creek, Fish Creek and Yellow Pup waste rock dumps. Based on current life of mine plans, there will be an estimated 790 acres of waste rock dumps requiring reclamation. Reclamation of waste rock dumps will be initiated once that they are no longer required for waste rock disposal. FGMI will concurrently reclaim inactive dumps that will not be subject to future disturbance. Based on the current mining schedule, concurrent reclamation of waste rock dumps is scheduled to begin in 2009.

Reclamation of the waste rock dumps will entail sloping and contouring of the dumps. The crests of the waste rock dumps will be rounded with material pushed outward to establish a slope of approximately 2.5H:1V or flatter. Most waste rock dump side slopes will be constructed with multiple lifts to minimize the cost of sloping. The tops of the dumps will be rounded to minimize impoundment of storm waters and snowmelt. Large boulders that are uncovered during sloping may be left on the surface to provide topographic diversity, microhabitats for wildlife and vegetation, and to break the linear appearance of the final slope.

Following sloping and contouring, the existing waste rock will be evaluated for its suitability as a growth media to establish vegetative cover. The waste rock dumps at Fort Knox will contain variable amounts of finer grained material that may be suitable as a growth media. If it is determined by FGMI that the waste rock does not provide a growth medium that will support the successful establishment of vegetation, a minimum of six inches of growth media will be placed. If attempts to establish vegetation on waste rock prove not to be successful, growth media will be placed. Where growth media is determined to be needed, the depth of growth media placed will be dependent upon the quality of the underlying waste rock, but typically, a minimum of six inches of growth media will be placed.

When final sloping, contouring, and growth media placement (if required) have been completed, waste rock dumps will be ripped along the contour. Contour ripping will reduce the erosion potential by reducing smooth slope length with the series of furrows created that will also increase infiltration. Ripping on the contour will provide micro-habitats for increased moisture retention and

seed germination. Brush berms and/or sedimentation berms will be constructed at the toe of dumps where feasible. The berms will remain until a vegetative cover is established and the potential for erosion is minimized.

Waste rock dumps will be revegetated following completion of earthwork. Due to the rocky, irregular nature of the final slopes, broadcast-seeding methods will be utilized. Seed and fertilizer will be applied as discussed in Section 5.2.

6.10 Building and Equipment Sites

As facility components of the site are decommissioned, materials, equipment, and buildings will be removed. Non-hazardous and nontoxic solid waste such as lumber and non-salvageable metal scrap will be burned and/or disposed in the permitted solid waste landfill. Hazardous and toxic materials such as reagents, petroleum products, acids, and solvents will be moved off-site by licensed transporters and either returned to the vendor or disposed at licensed facilities. Equipment and piping not needed for the reclamation and monitoring process will be utilized at another mining site, sold, salvaged or disposed in an approved manner. Past experience indicates that most equipment will be either utilized at other facilities or sold.

Buildings remaining at Fort Knox when the mine ceases production will include the mill building, portable office buildings, truck shop, warehouse, and other buildings as listed in Table 6.1. As the various site components cease operation, associated buildings will be emptied, dismantled, and removed from the site unless otherwise agreed upon by FGMI, ADNR and MHLTO. These

Table 6.1 List of Fort Knox Buildings at Completion of Mining

Buildings	Square Feet
Crusher	6,700
Pump Houses	3,400
Mill	60,000
Administration Building	6,200
Mine Shop, Dry and Warehouse Complex	49,500
Process Plant Offices and Shops	8,730
Assay and Metallurgical Laboratory	5,360
Reagent Storage Facilities	11,920
Tailing Detox Plant	6,600

structures may be utilized at other operations, sold, or salvaged. If sold or salvaged, it is likely that the purchaser or salvager will do removal. Above ground foundations will be reduced to rubble down to ground level and buried in-place with a minimum of two feet of material. Material used for burying foundations will be a combination of waste rock and growth media.

Reclamation of building and equipment sites will follow procedures outlined previously. Sites will be graded for proper drainage, ripped and scarified and revegetated. If growth media is needed it will be placed at a depth of approximately six inches.

6.11 Wells and Well Closure

Because of the need for constant dewatering of the pit during operation, several groundwater wells have been drilled at Fort Knox. All wells will be plugged and abandoned when no longer required. Well abandonment will be conducted according to ADEC regulations (**18 AAC 80.015**) in effect for water production wells at the time of abandonment.

Abandonment procedures will include:

- removal and disposal of pumps and piping,
- plugging of the well with an approved sealing material at total depth,
- removal of the collar,
- minor grading around the well site, and
- revegetation.

6.12 Miscellaneous Sites

Fence Removal

The mill, shop, and reagent storage areas are fenced with approximately 3,500 feet of 8-foot high chain-link. Fencing around reagent storage areas will remain in place until the reagents and chemicals are removed from the site. Fencing will be removed and salvaged, buried in the permitted landfill or buried in an approved landfill.

Electrical Power Facilities

One primary and four secondary electrical power substations service Fort Knox. When large electrical power requirements are no longer necessary, the secondary substations and associated facilities will be removed from the site. All overhead power lines located on the Millsite Lease will be removed unless approved to remain by ADNR and MHTLO and agreed to by FGMI. All materials removed will be salvaged or disposed in an approved facility.

Material Borrow Areas

During initial site construction and periodic raises to the tailing dam, several material borrow areas were used to provide the necessary construction material (road base, rip-rap, seal, and filter

materials). All borrow areas disturbed will be reclaimed with the exception of the following:

- Borrow Area #8 is located adjacent to the north side of the water reservoir spillway. This rock-terraced area provides potential nesting habitat for swallows and raptors.

- Borrow Area #11, located directly west of the fresh water pump station, has been designated as a post-closure parking area for day users expected at the water supply reservoir.

7.0 MONITORING

The *Fort Knox Mine Monitoring Plan* (FGMI, 2005) gives a detailed description of the monitoring requirements for the site, including the Tailing Storage Facility, the pit lake, the stream corridor/wetlands and the Water Supply Reservoir. The monitoring plan includes:

- Water quality sampling procedures and analytical profiles and sampling schedules;
- Characterization of acid rock drainage and processed tailing;
- Monitoring of solid waste landfill leachate;
- Potable Water Monitoring Requirements;
- Wildlife mortality reporting procedures;
- Documentation, record keeping and reporting requirements;
- Quality Assurance/Quality Control manual

FIGURE 5.0
RECLAMATION & CLOSURE SCHEDULE